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The following paper will be presented at the *DOE Pollution Prevention Conference XIV*, June 1-4 in Seattle, Washington. The document, however, is not official "DOE guidance," and is offered only as general information, which may be of use to our Web site users.

Progress on DOE TRI Reduction Goal, Update of EPA's TRI Expansion Efforts, and Results of DOE TRI Chemical Use Reporting Pilot
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Jane Powers
U.S. Department of Energy
RCRA/CERCLA Division, EH-413
(202) 586-7301

Dwight B. Emerson and Karen Cushman
Analytical Services, Inc.
(301) 596-7673

Abstract
Executive Order 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*, and DOE's *Pollution Prevention Program Plan* both establish a 50% agency wide reduction goal in the releases and off-site transfers (for treatment and disposal) of listed toxic chemicals. This paper presents the toxic chemical release inventory (TRI) data reported by DOE sites for 1994, 1995, and 1996, compares the data to the 1993 baseline, highlights the source reduction activities and accomplishments, and summarizes the Department's progress toward achieving the reduction goal. Also, suggestions to help sites prepare for the annual TRI public data release are discussed.

In addition, this paper presents an update of EPA's proposed further expansion of TRI, including reporting of chemical use information, revising the TRI chemical list, lowering of some chemical reporting thresholds, clarifying the Pollution Prevention Act reporting requirements and modifying the TRI Form R.

In response to EPA's October 1, 1996, Advanced Notice of Proposed Rulemaking on chemical use reporting, two DOE sites participated in a chemical use pilot study. Currently, the states of New Jersey and Massachusetts require chemical use reporting in addition to TRI reporting. Using the instructions and chemical use reporting portions of the New Jersey Form, two DOE sites (Kansas City Plant & Los Alamos National Laboratory), reported TRI chemical use for reporting year 1996, documented the problems they encountered in completing the form, and described the benefits and burdens of chemical use reporting to the facility. This paper also presents the results of these two pilot studies.

Keywords: TRI reporting, TRI release reduction, TRI expansion efforts, TRI chemical use reporting pilot

Introduction
TRI reporting is required by covered facilities meeting reporting thresholds under Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). Reporting is intended to provide the public with information on the releases of listed toxic

chemicals in their communities and to provide EPA with release information to help determine if future regulations are needed. TRI reporting applies to facilities within certain Standard Industrial Classification (SIC) codes with 10 or more full-time employees (or hourly equivalent) that annually manufacture, or process more than 25,000 pounds, or otherwise use more than 10,000 pounds of a listed toxic chemical.(1) Under Executive Order 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*, all federal facilities meeting the employee and any of the manufacture, process, or otherwise use thresholds are required to report regardless of their SIC code.(2)

During the past few years, EPA has been expanding the coverage of TRI reporting. Under TRI Phase I expansion, the number of chemicals on the toxic chemical list was increased from 361 to 647 chemicals.(3) Under TRI Phase II expansion, the kinds of facilities and applicable SIC codes were broadened to include additional types of activities.(4)

Progress on DOE TRI Reduction Goal

E.O. 12856 Goal and Baseline

E.O. 12856, Section 3-302, directs each federal agency to establish a 50% reduction goal, to be attained by December 31, 1999, in complex-wide releases and off-site transfers for treatment and disposal of toxic chemicals. The releases and off-site transfers reported under section 8.1 and 8.7 of the annual TRI Form R report are used in measuring progress toward the 1999 reduction goal. To the maximum extent possible, the reductions are to be achieved by source reduction practices.(2)

Through previous voluntary TRI reporting efforts, DOE was able to establish 1993 as its baseline year for measuring reductions under E.O. 12856.(5) The baseline is defined by the 23 DOE sites reporting on 28 listed toxic chemicals. The DOE 1993 baseline of complex-wide releases and transfers (Form R sections 8.1+8.7) is 4,677,346 pounds. To meet the 50% reduction goal, DOE had to achieve an overall 2,338,673 pounds reduction in the reported releases and transfers for treatment and disposal as depicted in figure 1.

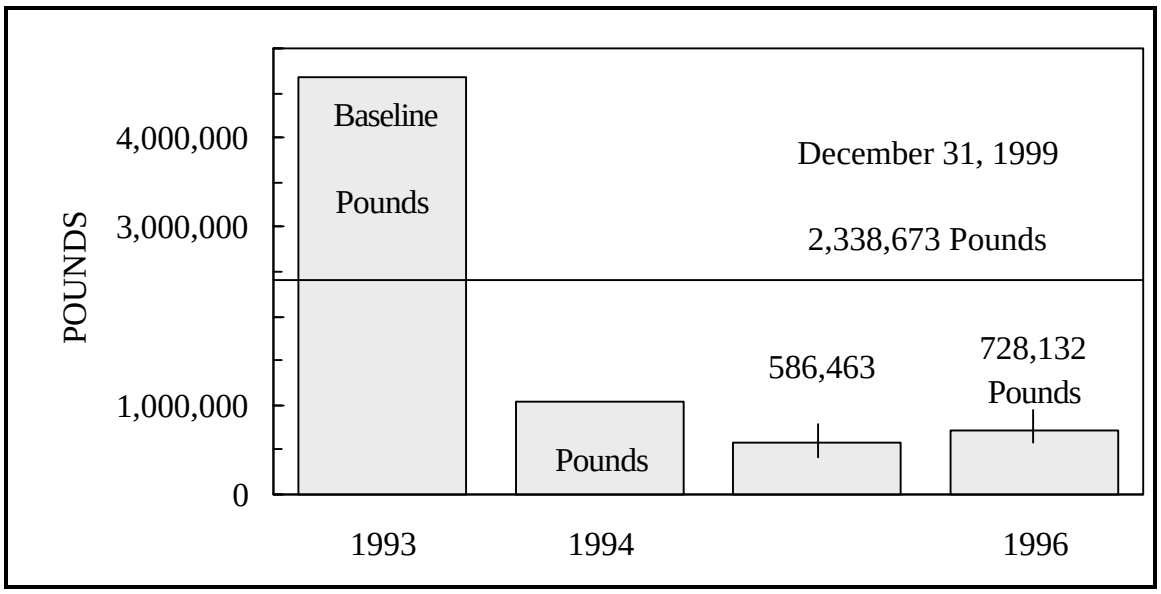

Figure 1. Total DOE TRI releases and transfers

Chemical Reductions

DOE sites have made significant reductions in reported releases and transfers. For 1996, the complex-wide total of releases and off-site transfers for treatment and disposal was 728,132 pounds. This represents an 84% (3.9 million pounds) reduction from the 1993 baseline (see tables 1 and 2). However, a large part of this reduction was not achieved through source reduction methods. About 3.3 million pounds of the reduction in methanol releases is due to the Naval Petroleum Reserve #1's (NPR-1) implementation of better measurement practices that began in 1994. Deletions of acetone and non-aerosol forms of sulfuric acid and hydrochloric acid from the TRI list of reportable chemicals are largely the reason for reported reductions in these chemicals.

Table 1: Comparison of 1993-1996 DOE TRI data by site (in pounds)

DOE SITE	1993	1994	1995	1996	% Change (1993-1996)
NPR-1	3,782,920	463,248	363,447	536,116	(86%)
INEEL	369,454	244,463	3,850	8,500	(98%)
Portsmouth	171,918	2,781	2,034	NR	(100%)
ETEC	101,249	64,727	28,153	11,511	(89%)
SRS	79,372	84,907	17,143	23,910	(70%)
Y-12	74,201	72,300	36,384	28,317	(62%)
Pinellas	45,824	12,751	NR	NR	(100%)
SLAC	12,300	25,900	NR	NR	(100%)
KCP	1,400	20,790	30,761	140	(90%)
NPR-3	95	24,410	81,692	102,067	107,339%
Other DOE sites	38,613	32,156	22,999	17,571	(54%)
TOTAL	**4,677,346**	**1,048,433**	**586,463**	**728,132**	**(84%)**

NR- Not Reported

Table 2: Comparison of 1993-1996 DOE TRI data by chemical (in pounds)

DOE CHEMICAL	1993	1994	1995	1996	% Change (1993-1996)
Methanol	3,655,979	356,017	362,800	539,979	(85%)
Sulfuric Acid	311,903	244,567	NR	NR	(100%)
Dichlorotetrafluoroethane	170,000	NR	NR	NR	(100%)
Hydrochloric Acid	154,745	130,392	1,350	1,030	(99%)
Nitric Acid	126,268	71,797	4,148	12,424	(90%)
Ammonia	113,350	66,846	59,421	35,095	(69%)
Xylene (mixed isomers)	16,644	13,924	30,918	34,978	110%
Toluene	12,408	8,968	20,076	25,000	101%
Ethylbenzene	400	469	19,781	22,000	5,400%
Benzene	378	40,286	25,740	22,000	5,720%
Other TRI Chemicals	115,271	115,167	62,229	35,626	(69%)
TOTAL	**4,677,346**	**1,048,433**	**586,463**	**728,132**	**(84%)**

NR- Not Reported

However, if the NPR-1's methanol reports and all the acetone, sulfuric acid, and hydrochloric acid reports for 1993-1996 are excluded, DOE has still achieved a 63% reduction in reported releases and transfers (see figure 2). While chemical reductions at some sites can be attributed to ceased or decreased production/operation, some sites have achieved true source reductions in TRI chemicals through: chemical substitution, equipment and process modifications, and recycling rather than disposing of chemicals. Based on the quantities being released, the best opportunity for further source reductions are for the following TRI chemicals: methanol, ammonia, xylene (mixed isomers), toluene, ethylbenzene, and benzene.

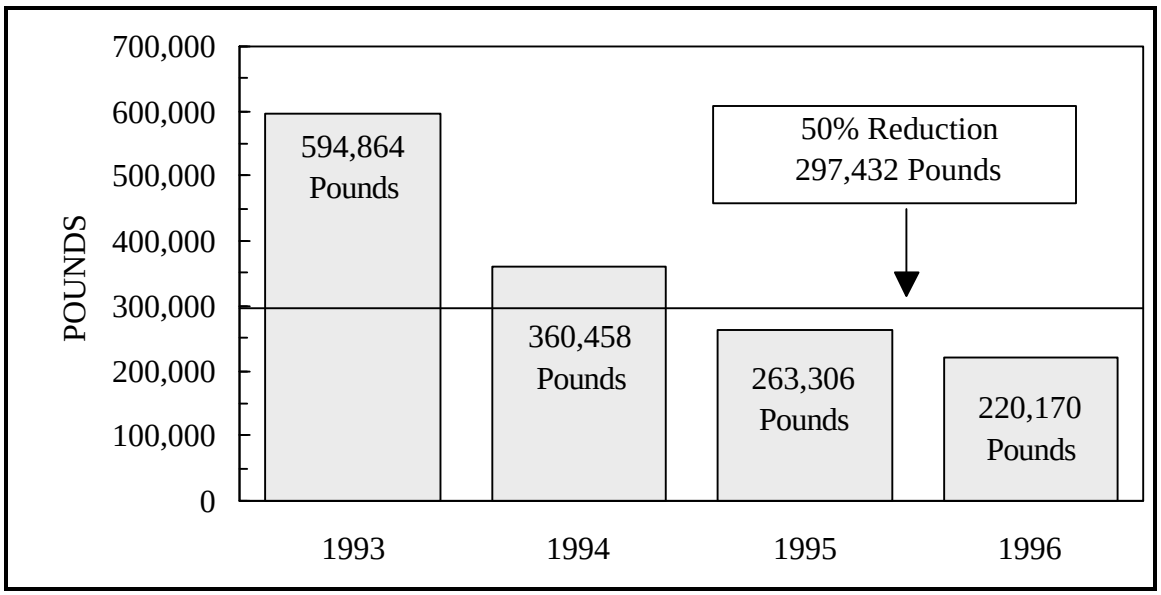

Figure 2. Total DOE TRI releases and transfers less all acetone, sulfuric acid, hydrochloric acid and NPR-1's methanol form R reports

Preparing for the Annual TRI Public Data Release

Each year EPA makes available to the public information that has been reported to the TRI. The importance of being prepared for this public data release can be illustrated by the case of DOE's NPR-1 site in Elk Hills, CA. Following EPA's 1993 data release, NPR-1 was characterized in a local newspaper as "the biggest polluter in the county." The fact that the release was to a permitted injection well that represented no threat to public health and the environment was not explained.

To help DOE sites prepare for the annual TRI public data release, consider taking the following actions. First, be aware of how TRI information is used. DOE headquarters uses the information to prepare annual reports on agency-wide pollution prevention activities and progress toward reaching goals. Local communities use TRI data to assess potential risks to health and the environment. Second, put your reported information into context for the region. If your releases are comparatively large compared to other area Form R reports, be prepared to explain the significance of what has been reported and what the site is doing to reduce releases. Where applicable, explain why the subject chemicals do not pose a threat to the community and environment. Third, be proactive with the news media. Use existing reporting mechanisms, including Annual Site Environmental Reports, to describe pollution prevention activities and accomplishments.

Update of EPA's Expansion Efforts

TRI Phase III

In the October 1, 1996, *Federal Register*, EPA published an Advanced Notice of Proposed Rulemaking (ANPR) on TRI Phase III expansion. The notice describes EPA's considerations on expanding TRI reporting to include chemical use information and occupational exposure indicator data. "Chemical Use" refers to the information most commonly described as materials accounting data which includes: amounts of a toxic chemical coming into a facility, amounts transformed into products and wastes, and resulting amounts leaving the facility site. EPA believes that chemical use information could provide insights on issues such as: emergency preparedness issues related to the amounts of chemicals flowing through communities, the overall quantities of toxics going into products, worker safety and health issues, and facility pollution prevention performance.(6)

The ANPR briefly describes EPA's classification of TRI Phase III key issues into five major categories: 1) questions about the premise for and utility of chemical information, 2) agency-wide environmental reporting issues, 3) impacts on confidential business information (CBI), 4) cost estimates, and 5) technical collection and interpretation issues. EPA encouraged comments on the key issues and on all aspects of its decision to develop a proposed rule for chemical use reporting.(6) The notice is available on the Internet via EPA's TRI Homepage at http://www.epa.gov/opptintr/tri. DOE's comments to the ANPR are available on the internet at http://tis-nt.eh.doe.gov/oepa. The proposed TRI Phase III rule was scheduled under EPA's Regulatory Plan [October 29, 1997, (*62 FR 57141*)] to be

issued in August 1998. However, EPA has indicated that date may change as a result of comments that were received in response to the ANPR.(7)

Revising the TRI Chemical List

In the May 7, 1997, *Federal Register*, EPA issued a proposed rulemaking on the addition of dioxin and 27 dioxin-like compounds to the list of TRI chemicals. EPA believes these dioxin and dioxin-like compounds meet the criteria for addition to the list of toxic substances under EPCRA section 313(d)(2)(B).(8) On April 6, 1998, (*63 FR 16754)*, EPA issued a notice of public meeting on May 1, 1998, to discuss the proposed rulemaking and lowering of thresholds (see section on "Lowering of Chemical Reporting Thresholds" for further information.)

In July 1998, EPA expects to propose a review of the environmental and toxicology data for all listed TRI chemicals to determine whether the data conforms with the statutory criteria for listing chemicals to the TRI. If the data for a listed chemical does not meet the statutory criteria, that chemical will be delisted. Final action is expected in December 1998.(7)

Lowering of Chemical Reporting Thresholds

Currently, TRI reporting is required by facilities that manufacture or process 25,000 pounds or more of a listed toxic chemical or otherwise use 10,000 pounds or more of a listed toxic chemical. EPA is considering lowering the thresholds for those chemicals it considers to be highly toxic at very low dose levels or have properties that make them persist for extended periods of time in the environment, and/or bioaccumulate through the food chain. This also applies to the proposed addition of dioxin and dioxin-like compounds which are generally produced at levels lower than the current TRI reporting thresholds. Small releases of the chemicals described above, which are not reported under TRI, can have significant impacts on human health and the environment.(8) EPA is performing studies to determine which chemicals are considered most persistent, bioaccumulative, and toxic (PBT) to determine what revised threshold value(s) should be developed for these PBT chemicals. An ANPR was expected to be issued by EPA in March 1998 to lower the thresholds for reporting certain chemicals.(7) At this time, no further information has been given by EPA regarding a new date for issuance of the ANPR.

Clarifying Pollution Prevention Act Reporting Requirements and Modifying the TRI Form R

EPA has held eight public meetings to solicit comments on TRI reporting. The purpose of the meetings is for stakeholders to provide comments on ways to improve the type of right-to-know information available to communities and to help streamline right-to-know reporting to reduce the reporting burden. These meetings were also intended to provide an opportunity for affected parties to participate in the development of a rule clarifying the Pollution Prevention Act requirements currently contained in section 8 of the Form R. (9) The following topics have been open for discussion at the meetings: format of the Form R, nomenclature used in the Form R; opportunities for burden reduction in the Forms R &

A; further clarification of data elements in Form R; and presentation of data in public information documents. Related agendas, federal register notices, and issue papers can be found at EPA's TRI Homepage: http://www.epa.gov/opptintr/tri under the heading "TRI Stakeholder Dialogue."

A number of issues have been raised with the definition of "release" in section 5 of the Form R. Commenters believe that EPA's definition of "release" under EPCRA can be misinterpreted to mean that a release results in an actual exposure of people or the environment to a toxic chemical. Also, the public may assume that the larger the reported "release", the higher the risk potential. EPA is looking for suggestions on possible changes to the Form R and to the annual public data release.

Also, commenters have expressed concerns about how chemicals transferred off-site to publicly owned treatment works (POTWs) for further management are reported in section 6 of the Form R. Some commenters believe that users of this data incorrectly aggregate sections 5 and 6 together and treat them all as releases. They believe that at least some fraction of the quantity transferred will be treated and destroyed by the POTW and, thus, not released. Other commenters contend that some users of the data assume that transfers to POTWs are treated to 100% efficiency. They believe that many chemicals will only be treated to a very small degree by POTWs and the rest of the chemical will be released. EPA is asking for suggestions on other options to make the information on off-site transfers more useful by making the distinction between off-site treatment and off-site releases.

Several commenters have also expressed concern about public misperception of the data in section 8 of the Form R. Section 8 data provides information on waste managed at the facility regardless of whether the waste was generated by the reporting facility. Some commenters contend that only the facility responsible for generating the waste should report on the EPCRA section 313 chemical in the waste and the receiving facility should only report on any "new waste" generated. The commenters believe that the current EPA reporting requirements result in double counting when all wastes are summed across all the facilities. It has also been suggested that the following three new data elements be included in section 8: "total waste management activities", "quantities generated on-site", and "quantity received from off-site." EPA is looking for additional comments on how to change section 8 so that the user will still have access to information on wastes managed by the facility but would minimize the user's perception that the wastes reported in section 8 were generated by the reporting facility.

Results of DOE TRI Chemical Use Reporting Pilot

In response to the ANPR on TRI Phase III, DOE initiated a chemical use reporting pilot program at the Department's Kansas City Plant (KCP) and the Los Alamos National Laboratory (LANL), located in New Mexico. The states of New Jersey (NJ) and Massachusetts currently require materials accounting reporting in addition to TRI

reporting. KCP and LANL completed the 1995 NJ forms for Inputs (Section B, 5-8), Outputs (Section B, 9-12), and selected sections of the Pollution Prevention Activities and Progress Section C by using the NJ instructions for section 313 chemicals used at their facilities. These reporting form sections were selected because they were most reflective of the October 1996 ANPR requirements and because EPA is considering using the reporting elements from this form. Upon completion of the forms, the facilities completed a DOE burden evaluation form to indicate the number of increased labor hours for each reporting element with regard to managerial, technical, and clerical aspects of TRI reporting for the first and subsequent years. In addition, the facilities completed a DOE benefits evaluation survey to evaluate the usefulness and effectiveness of chemical use reporting to the facility. The facilities rated a series of statements on chemical use reporting that related to issues from the October 1996 ANPR.

KCP implemented the use of material accounting for five chemicals: chromium, copper, chlorodifluoromethane, nitric acid, and sulfuric acid. Upon completion of the pilot program, KCP felt that the definition of nonproduct output that is used by the State of NJ is complicated and difficult to understand. KCP also experienced problems obtaining material accounting information because their existing systems were not designed to track this type of information. KCP identified the following areas where information gaps existed: starting nonproduct inventory, quantity brought on-site, quantity shipped off-site in or as product, quantity recycled on-site, and quantity brought on-site as recycled material. KCP's average time to complete the NJ forms for each of the five section 313 chemicals reported was 19 person hours per chemical reported. In subsequent years, the primary burden would be to develop or modify the current data systems to accurately collect the required data elements. As a result of the start-up of the new or revised systems, approximately 41.4 person hours per chemical reported would be required to complete the NJ forms for the first couple of years. As the system developed, the average hours should decrease to an estimated 11.2 person hours per chemical reported. Overall, KCP reported that the benefits of chemical use reporting were associated with furthering pollution prevention. The following required data elements would increase the opportunities to identify and use alternative technologies for pollution prevention: tracking of starting inventory, nonproduct output, recycling out of process, and amount of material in product sent-off site.(10)

Using the same NJ forms that KCP used, LANL reported materials accounting information for nitric acid for the first year. For subsequent years, LANL anticipated that lead would also require TRI reporting. Upon completion of the pilot program, LANL did not report any problems in completing the NJ form for nitric acid. If chlorine had required reporting, LANL stated there would have been difficulties with determining what quantities of chlorine were considered nonproduct and product output. The problem is with the use of chlorine to treat wastewater which is then sent to the cooling towers at the power plant. Some of the treated wastewater is used in the cooling towers and some is discharged. LANL was unclear on whether this would be classified as product output, nonproduct output, or some of both. Overall, LANL generally felt that chemical use reporting provided minimal benefits to the facility. In some cases, the reporting

requirements would improve toxic chemical management by increasing the awareness and accuracy of chemical procurement and use tracking. LANL's average time to complete the NJ forms for one section 313 chemical reported was 21 person hours. LANL estimated 43 person hours would be required to complete the NJ forms for two section 313 chemicals in subsequent years.(11)

Conclusion

As an agency, DOE has met the overall 50% reduction goal as directed by the Executive Order 12856. In general, most reporting sites continued to further reduce releases and transfers of toxic chemicals in 1996. A significant exception was the NPR-1 site which reported an increased release of methanol relative to what was reported in 1995. The challenge will be to maintain these reductions if site activities increase, if additional chemicals are added to the TRI chemical list, and if reporting threshold levels decrease for some chemicals.

EPA continues to move forward with efforts to expand/modify community right-to-know TRI reporting. These changes are intended to improve the public's access to information on chemical releases and transfers in their communities and make reporting easier for facilities. DOE's experience with TRI reporting can be a valuable contribution to what EPA is trying to accomplish.

References

(1) 42 U.S.C. 11023, *§ 313 Emergency Planning and Community Right-to-Know Act of 1986.* October 17, 1986. pp 71:0407-71:0408

(2) 58 FR 41981. Executive Order 12856, *Federal Compliance With Right-to-Know Laws and Pollution Prevention Requirements.* August 3, 1993. pp 41983.

(3) 59 FR 61432. *Addition of Certain Chemicals; Toxic Chemical Release Reporting; Community Right-to-Know; Final Rule*. U.S. Environmental Protection Agency. November 30, 1994.

(4) 62 FR 23833. *Addition of Facilities in Certain Industry Sectors; Revised Interpretation of Otherwise Use; Toxic Release Inventory Reporting; Community Right-to-Know; Final Rule.* U.S Environmental Protection Agency. May 1, 1997.

(5) *Pollution Prevention Program Plan.* DOE/S-0118. U.S. Department of Energy. 1996. pp 3.

(6) 61 FR 51321. *Addition of Reporting Elements; Toxic Chemical Release Reporting; Community Right-to-Know; and Emergency Planning and Community Right-to-Know; Notice of Public Meetings; Proposed Rules.* U.S. Environmental Protection Agency. October 1, 1996. pp 51322, 51326-51329.

(7) 62 FR 57141. *The Regulatory Plan.* U.S. Environmental Protection Agency. October 29, 1997. pp 57143-57146, 57148.

(8) 62 FR 24887. *Addition of Dioxin and Dioxin-Like Compounds; Proposed Rule*. U.S. Environmental Protection Agency. May 7, 1997. pp 24887-24888.

(9) 63 FR 5517. *Public Meetings on the Toxics Release Inventory Reporting Form.* U.S. Environmental Protection Agency. February 3, 1998. pp. 5517.

(10) *U.S. Department of Energy Summary Report on a Pilot Program for Chemical Use Reporting* Conducted at *the Kansas City Plant*. U.S. Department of Energy. December 1997. pp 2-4.

(11) *U.S. Department of Energy Summary Report on a Pilot Program for Chemical Use Reporting Conducted at the Los Alamos National Laboratory.* U.S. Department of Energy. April 1998.